

WHAT IS CLAIMED IS:

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A' 1. A *gro-1* gene which has a function at the level of cellular physiology involved in developmental rate and longevity, wherein *gro-1* mutations cause a longer life and an altered cellular metabolism relative to the wild-type, wherein *gro-1* gene has the identifying characteristics of nucleotide sequence set forth in SEQ ID NO:3. — human

2. The *gro-1* gene of claim 1, which codes for a GRO-1 protein having the amino acid sequence set forth in Figs. 9A-9B as deduced from SEQ ID NO:3. — human

Whole-genome
SEQ ID NO: ?

has 0
amino
acid
sequences

3. A *gro-1* co-expressed gene which comprises a *gop-1* gene which codes for a GOP-1 protein having the amino acid sequence set forth in Figs. 13A-13C (SEQ ID. NO:4); wherein said *gop-1* gene is located in the *gro-1* operon and said *gop-1* gene is transcriptionally co-expressed with *gro-1* gene present in said operon.

4. A *gro-1* co-expressed gene which comprises a *gop-2* gene which codes for a GOP-2 protein having the amino acid sequence set forth in Figs. 14A-B (SEQ ID. NO:5); wherein said *gop-2* gene is located in the *gro-1* operon and said *gop-2* gene is transcriptionally co-expressed with *gro-1* gene present in said operon.

5. A *gop-3* gene which codes for a GOP-3 protein having the amino acid sequence set forth in Figs. 15A-15B (SEQ ID. NO:6); wherein said *gop-3* gene is located in the *gro-1* operon and said *gop-3* gene is transcriptionally co-expressed with *gro-1* gene present in said operon.

6. A hap-1 gene which codes for a HAP-1 protein having the amino acid sequence set forth in Figs. 16A-B (SEQ ID. NO:7); wherein said hap-1 gene is located in the gro-1 operon and said hap-1 gene is transcriptionally co-expressed with gro-1 gene present in said operon.

7. A GRO-1 protein which has a function at the level of cellular physiology involved in developmental rate and longevity, wherein said GRO-1 protein is encoded by the gene of claims 1 and 2.

8. A mutant GRO-1 protein which has the amino acid sequence set forth in Fig. 3D.

9. A GRO-1 protein which has the amino acid sequence set forth in Figs. 3A-3C (SEQ ID. NO:2).

10. A GRO-1 co-expressed protein which comprises a GOP-1 protein encoded by the gene according to claim 3; wherein said protein which has the amino acid sequence set forth in Figs. 13A-13C (SEQ ID. NO:4) and human homolog thereof.

11. A GRO-1 co-expressed protein which comprises a GOP-2 protein encoded by the gene according to claim 4; wherein said protein which has the amino acid sequence set forth in Fig. 14 (SEQ ID. NO:5) and human homolog thereof.

12. A GOP-3 protein encoded by the gene according to claim 5; wherein said protein which has the amino acid sequence set forth in Figs. 15A-15B (SEQ ID. NO:6) and human homolog thereof.

13. A HAP-1 protein encoded by the gene according to claim 6; wherein said protein which has the amino acid sequence set forth in Fig. 16 (SEQ ID. NO:7).

14. A method for the diagnosis and/or prognosis of cancer in a patient, which comprises the steps of:

- a) obtaining a tissue sample from said patient;
- b) analyzing DNA of the obtained tissue sample of step a) to determine if the human *gro-1* gene is altered, wherein alteration of the human *gro-1* gene is indicative of cancer.

15. A mouse model of aging and cancer, which comprises a gene knock-out of murine gene homologous to *gro-1* gene of claims 1 and 2.

16. A method of regulating physiological processes of tissues, organs and/or whole organism of a host which comprises a compound interfering with enzymatic activity of GRO-1 of claim 7, 8 or 9.

17. A method of regulating physiological processes of tissues, organs and/or whole organism of a host which comprises a compound interfering with enzymatic activity of GOP-1 of claim 10.

18. A method of regulating physiological processes of tissues, organs and/or whole organism of a host which comprises a compound interfering with enzymatic activity of GOP-2 of claim 11.

19. A method of regulating physiological processes of tissues, organs and/or whole organism of a host which comprises a compound interfering with enzymatic

activity of GOP-3 of claim 12.

20. A method of regulating physiological processes of tissues, organs and/or whole organism of a host which comprises a compound interfering with enzymatic activity of HAP-1 of claim 13.

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